



My Math Academy Empowers Pre-K and Kindergarten Teachers to Provide Personalized, Equitable Instruction to Accelerate Learning

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Key Findings

- In a school year disrupted by the pandemic, nearly 80 teachers working with more than 1,200 students found the data and resources in My Math Academy empowering, enabling them to tailor their instruction and gain a deeper understanding of individual students' math progress.
- Teachers indicated that My Math Academy enabled them to equitably provide every child with an equal chance of success.
- Students who used My Math Academy for 30 minutes per week, on average, experienced a two- to threefold increase in their math knowledge and demonstrated gains beyond their grade level.
- Teachers reported that My Math Academy significantly improved students' interest, enjoyment, and confidence in learning math.

Overview

Over the course of the 2020–2021 school year, many of the millions of children who were learning remotely due to the COVID-19 pandemic gradually returned to in-person schooling. By the end of the school year, students were, on average, four to five months behind in math and reading,¹ and while many students had substantial amounts of unfinished learning for their grade level, the greatest amount was concentrated among BIPOC.^{2,3,4}

In addition to living in communities with higher risks of COVID-19 and having parents who are more likely to be essential workers on the front lines of the pandemic, many BIPOC students lost access to services such as meals, health care, and mental health services during school closure. Remote learning also highlighted the unequal impacts of the pandemic, as these students more often lacked technology and experienced more inconsistent internet access than their white counterparts. These disparate impacts have left students of color even further behind in meeting the pre-pandemic expectations for math and reading. Similar trends were observed among students with disabilities, English language learners, and those attending Title I schools.^{5,6}

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¹ Dorn, E., Hancock, B., Sarakatsannis, J., & Viruleg, E. (2020). COVID-19 and student learning in the United States: The hurt could last a lifetime. *McKinsey & Company*, 1.

² Kuhfeld, M., Soland, J., Tarasawa, B., Johnson, A., Ruzek, E., & Liu, J. (2020). Projecting the potential impact of COVID-19 school closures on academic achievement. *Educational Researcher*, 49(8), 549–565.

³ Meckler, L., & Natanson, H. (2020). A lost generation: Surge of research reveals students sliding backward, most vulnerable worst affected. *Washington Post*.

⁴ Renaissance Learning, Inc. (2020). *5.3 million star assessments show the true impact of the COVID slide*. Retrieved from <https://www.renaissance.com/2020/11/23/news-5-3-million-star-assessments-show-true-impact-covid-slide/>

⁵ Office for Civil Rights. (2021). *Education in a pandemic: The disparate impacts of COVID-19 on America's students*. Retrieved from <https://www2.ed.gov/about/offices/list/ocr/docs/20210608-impacts-of-covid19.pdf>

⁶ Renaissance Learning, Inc. (2021). *How kids are performing: Tracking the midyear impact of COVID-19 on reading and mathematics achievement (Winter 2020–2021 Edition)*. Retrieved from <https://www.renaissance.com/2020/11/23/news-5-3-million-star-assessments-show-true-impact-covid-slide/>

Teachers returning to the classroom in the 2020–2021 school year also faced numerous challenges. Many teachers adopted some combination of in-person and remote instruction, which demanded more time and resources, and student attendance was low and inconsistent.⁷ In a survey of more than 1,000 K–12 teachers conducted in early 2021 by RAND, about 75% of the respondents indicated as one of their top three stressors “teaching in-person and remotely at the same time,” along with other factors such as engaging students, supporting their social and emotional needs, and concerns about teachers’ own health and that of their families.⁸ Such job-related stress resulting from the pandemic compounded the stressors that teachers experienced prior to the pandemic, such as insufficient pay, less than optimal working conditions, lack of administrative support, and the difficulty of providing appropriately challenging and personalized learning experiences for each student in the class.^{9,10}

In anticipation of the extraordinary challenges that characterized the 2020–2021 school year, many educators and administrators across thousands of districts in the country searched for effective educational resources to support learning and teaching. One such district was the Harlingen Consolidated Independent School District in Texas. Harlingen is a city (population ~86,000) located in Cameron County, the southernmost county in the state of Texas, where 82% of the population are identified as Hispanic or Latino, and about 33% of the families have income below the poverty level.¹¹

About 80% of the students in the district are eligible to participate in the free and reduced-price meal program,¹² and in fall of 2020, 61% of children in

pre-K were classified as “at-risk,” meaning that they did not perform satisfactorily on a readiness test or an assessment administered during the school year. Given the crucial role of early mathematics skills and knowledge in later academic success,¹³ the early childhood education administrators in Harlingen specifically sought resources that could address the following needs: (1) inspire a love of math in their youngest learners (ages 3–4), (2) equitably strengthen these young children’s foundational math knowledge, and (3) equip educators with insights about each learner’s strengths and weaknesses as well as tools to provide personalized instruction for each student. They identified Age of Learning’s My Math Academy as the resource that could address their needs, as it had been found to be effective in helping young learners,^{14,15} and they piloted the program in 77 early childhood education classrooms during the 2020–2021 school year.

Like many school districts across the country, Harlingen began the school year with all students learning remotely, and teachers worked with individual students’ families to ensure that each child could log in to the program from home. By the end of the school year, about 67% of the students had returned to in-person instruction while 30% continued with remote schooling.

My Math Academy Program

My Math Academy is built on the Personalized Mastery Learning Ecosystem™ (PMLE™) framework and is designed to help children (ages 3–9) build a solid foundation of number sense and operations. It consists of three components that work together to

7 The Inverness Institute. (2021). *Teachers reflect on a year of learning under Covid: A survey of California teachers by the Inverness Institute*. Retrieved from <https://edsources.org/2021/teachers-reflect-on-a-year-of-learning-under-covid-california-teacher-consultant-response-network/648206>

8 Steiner, E. D., & Woo, A. (2021). Job-related stress threatens the teacher supply: Key findings from the 2021 state of the US teacher survey. Technical Appendixes. Research Report. RR-A1108-1. RAND Corporation.

9 Carver-Thomas, D., & Darling-Hammond, L. (2017). Teacher turnover: Why it matters and what we can do about it. *Learning Policy Institute*.

10 Goddard, R., Goddard, Y., Sook Kim, E., & Miller, R. (2015). A theoretical and empirical analysis of the roles of instructional leadership, teacher collaboration, and collective efficacy beliefs in support of student learning. *American Journal of Education*, 121(4), 501–530.

11 U.S. Census Bureau. (2019). 2019 *American community survey single year estimates*. Retrieved from <https://www.census.gov/newsroom/press-kits/2020/acs-1year.html>

12 McFarland, J., Hussar, B., Zhang, J., Wang, X., Wang, K., Hein, S., Diliberti, M., Forrest Cataldi, E., Bullock Mann, F., & Barmer, A. (2019). The Condition of Education 2019 (NCES 2019-144). U.S. Department of Education. Washington, DC: National Center for Education Statistics. Retrieved from <https://nces.ed.gov/pubsearch/pubsinfo.asp?pubid=2019144>

13 Watts, T. W., Duncan, G. J., Clements, D. H., & Sarama, J. (2018). What is the long-run impact of learning mathematics during preschool?. *Child Development*, 89(2), 539–555. DOI:10.1111/cdev.12713

14 Thai, K.P., Bang, H.J., & Li, L. (2021). Accelerating early math learning with research-based personalized learning games: A cluster randomized controlled trial. *Journal of Research on Educational Effectiveness*. DOI: 10.1080/19345747.2021.1969710

15 Bang, H.J. & Li, L. (2020). *My Math Academy significantly accelerates early elementary children’s math skills and fosters greater engagement in math: A replication of a randomized-control trial*. Age of Learning, Inc. Retrieved from: https://www.ageoflearning.com/My_Math_Academy_Research_Brief_2020.pdf

™ Dohring, D., Hendry, D., Gunderia, S., Hughes, D., Owen, V. E., Jacobs, D.E., Betts, A., & Salak, W. (2019). U.S. Patent No. 20190236967 A1. Washington, DC: U.S. Patent and Trademark Office.

increase children’s math skills and knowledge, as well as their motivation, confidence, and persistence in math learning. The three components are the child-facing Learning Games, the parent-facing At-Home Resources, and the educator-facing Teacher Dashboard. The parent and educator resources are fueled by student performance data collected from the Learning Games.

The child-facing program features more than 130 game-based activities that address 96 concepts and skills for prekindergarten through 2nd grade. The PMLE uses initial diagnostic assessments to measure each child’s prior knowledge and determine where they are placed within the program, based on what they know and are ready to learn next.¹⁶

Evidence of learning on each granular Learning Objective is collected as the student plays, and as they progress in My Math Academy, the adaptive system uses their performance to recommend Learning Games at a specific level of difficulty, based on a predetermined knowledge map of Learning Objectives and their prerequisite relationships.^{17,18,19,20} Within each activity, performance data is used to provide appropriate

scaffolding, adjust difficulty, and give formative feedback. Each game includes up to six Learning Activities at varying difficulty levels, including an in-game mastery check called the “boss” level. Students master the boss levels to demonstrate their skills and understanding, indicating that they are ready to move on to the next game. Figures 1 and 2 show examples of child-facing games in My Math Academy.

My Math Academy was also designed to align to existing state, national, and international mathematics standards. Each standard is unpacked into granular, measurable Learning Objectives; therefore, it is possible to articulate the specific concepts and skills students need to meet each state standard or sub-standard. This pilot provided the opportunity to examine students’ progress on each Texas Essential Knowledge and Skills (TEKS) standard by examining their individual progress in each My Math Academy game that directly maps onto a TEKS standard.



Figure 1. Students practice counting out quantities by helping the Shapeys do a head count for a boat ride.



Figure 2. Students learn to compare quantities of objects by helping Shapeys working at the toy factory to compare groups of toys.

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- 16 Betts, A. (2019). Mastery learning in early childhood mathematics through adaptive technologies. In IAFOR (Ed.). *The IAFOR International Conference on Education—Hawaii 2019 Official Conference Proceedings* (pp. 51–63). Japan: The International Academic Forum.
- 17 Mislevy, R. J., Almond, R. G., & Lukas, J. F. (2003). A brief introduction to evidence-centered design. *ETS Research Report Series*, 2003(1), i–29.
- 18 Shute, V. J. (2011). Stealth assessment in computer-based games to support learning. In S. Tobias & J. D. Fletcher (Eds.), *Computer Games and Instruction*, 503–524. Retrieved from http://myweb.fsu.edu/vshute/pdf/shute%20pres_h.pdf
- 19 Groff, J., Clarke-Midura, J., Owen, V. E., Rosenheck, L., & Beall, M. (2015). *Better learning in games: A balanced design lens for a new generation of learning games* [white paper]. Cambridge, MA: MIT Education Arcade and Learning Games Network. Retrieved from <https://www.media.mit.edu/publications/better-learning-in-games-a-balanced-design-lens-for-a-new-generation-of-learning-games/>
- 20 Owen, V. E., & Hughes, D. (2019). Bridging two worlds: Principled game-based assessment in industry for playful learning at scale. In *Game-Based Assessment Revisited* (pp. 229–256). Springer, Cham.

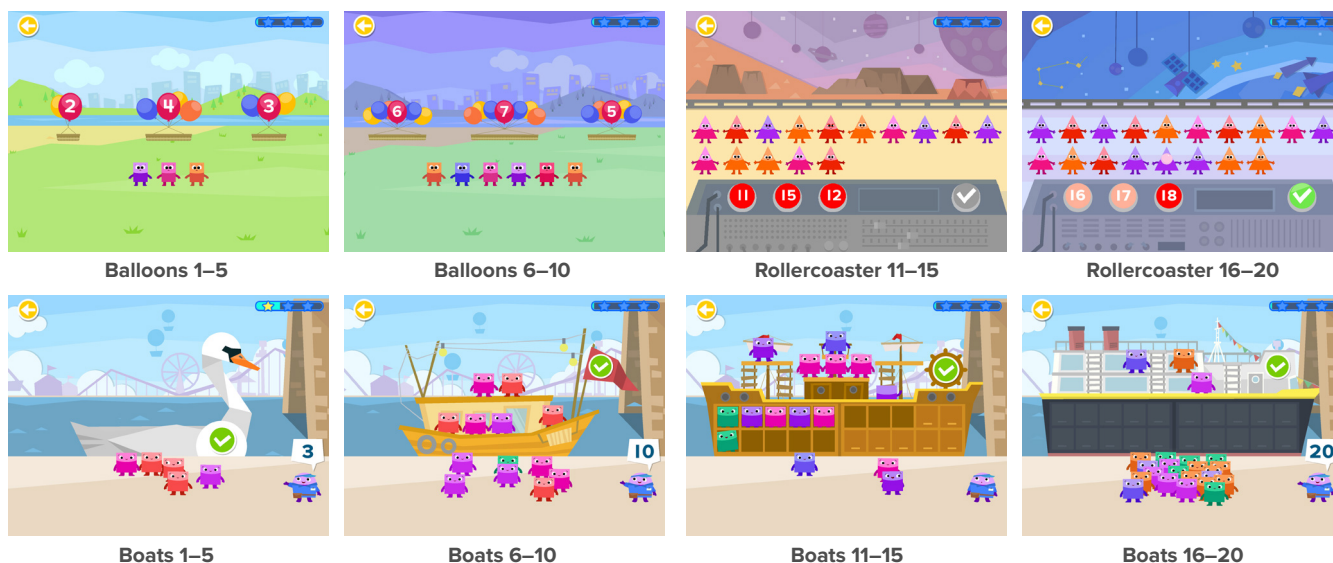


Figure 3. A total of eight Math Math Academy games directly align with the TEKS.111.2.b.2 sub-standard for Numbers and Operations. Each game addresses distinct aspects of counting (e.g., one-to-one correspondence, cardinality, and counting out sets). Demonstrating mastery on all games that map onto the sub-standard indicates that the student has met that sub-standard.

My Math Academy Teacher Dashboard

My Math Academy's Personalized Mastery Learning Ecosystem includes a comprehensive digital portal to support teachers' instructional decision making.²¹ The Teacher Dashboard provides real-time student progress data and supplemental materials based on each student's progress. The goal of the Teacher Dashboard is to provide teachers with a precise approach to differentiated instruction. It enables the teacher to monitor students' progress individually and as a whole class, which can be filtered into teacher-created groups (Figure 4a).

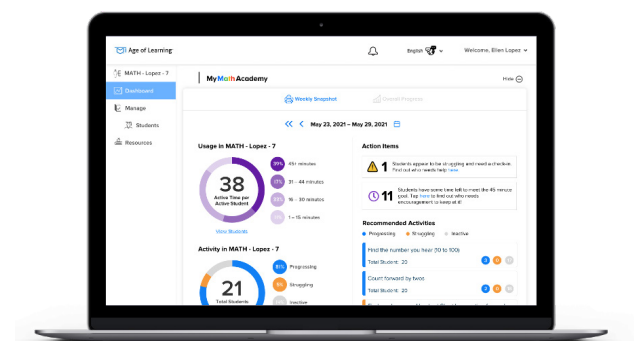


Figure 4a. Sample Dashboard display of usage and progress for a whole class and for individual students. This snapshot view provides teachers with a quick overview of students' status (e.g., inactive or in progress), how they are doing on their respective Learning Objectives, overall usage across classrooms, recommended activities for individual students or groups, and other key items that require teacher attention.

Teachers can also view data about each student's progress on each Learning Objective or standard, understand how they are doing in reference to grade-level standards (Figure 4b), and access recommendations about grouping students at similar levels based on their in-game performance (i.e., ready to learn, need for review, reinforcement, or intervention).

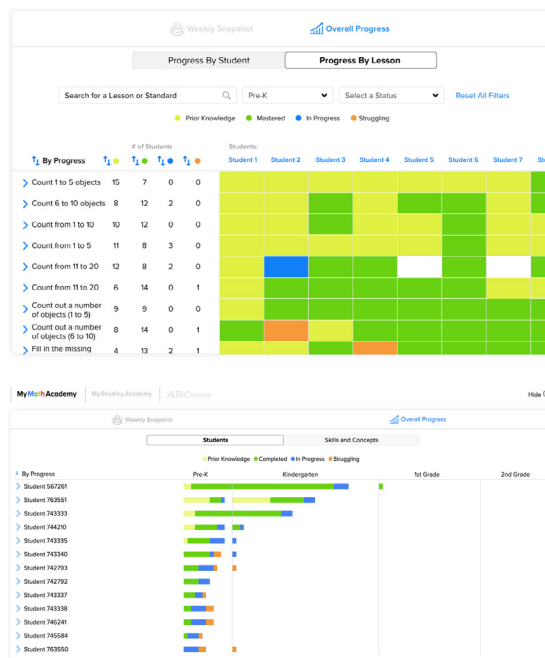


Figure 4b. Progress Dashboard displays color-coded student performance data by skill (left) and by student (right) for the whole class.

21 Betts, A., Thai, K. P., Gunderia, S. (2021). Personalized Mastery Learning Ecosystems: Using Bloom's Four Objects of Change to Drive Learning in Adaptive Instructional Systems. In R. A. Sottilare & J. Schwarz (Eds.) *Adaptive Instructional Systems: Design and Evaluation*. HCII 2021. Lecture Notes in Computer Science, vol 12792. Springer, Cham. https://doi.org/10.1007/978-3-030-77857-6_3

The Dashboard also suggests activities that can be flexibly integrated into classroom instruction for students who may need additional support. It can also identify topics and activities of high value for individual students and for small-group or whole-class instruction (Figure 4c).

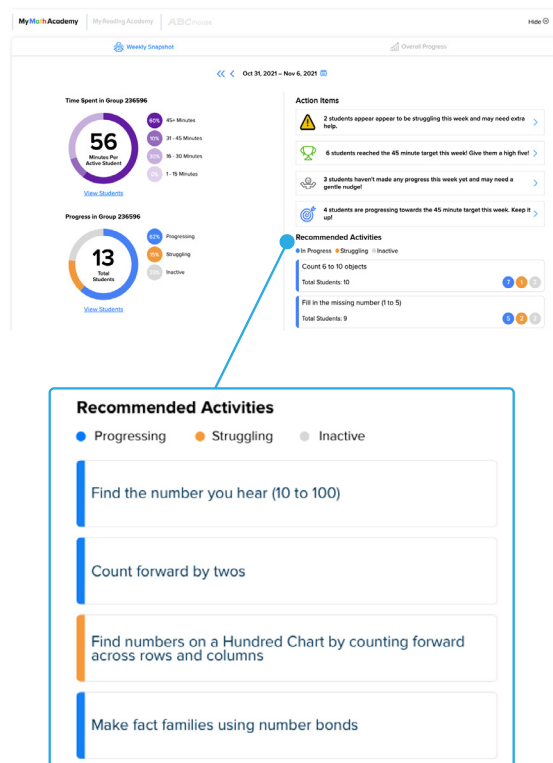


Figure 4c. Individual Student view provides information about the overall usage and progress of a specific student, details about specific lessons the student is currently working on, and recommended offline activities that teachers can do with the student, aligned with what that student is currently learning.

Participants

Across 17 high-need schools in Harlingen, a total of 976 prekindergarten students in 57 classrooms and their educators participated in the pilot of My Math Academy from September 2020 to June 2021. Most students (847) were four-year-old children in regular prekindergarten programs (Pre-K4), while 129 were three-year-old children enrolled in a program partially funded by the U.S. Department of Health and Human Services' Head Start program (Pre-K3). Although all students had access to My Math Academy for the entire school year, they began using the program at various times, with 8% starting in September and the majority (80%) starting between October and December of 2020.

Upon hearing about the successes of the prekindergarten implementation of My Math Academy, 20 kindergarten teachers requested to join the pilot in April 2021. A total of 252 kindergarten students used the program from April 2021 to June 2021.

Procedures

Prior to the start of implementation, all Pre-K3 and Pre-K4 teachers participated in a two-hour live virtual training on My Math Academy, which included video introductions (3–9 minutes each) of how My Math Academy works, the students' first-time user experience, and an overview of the Teacher Dashboard (student account management, exploring Dashboards, and how to get started). In between the videos, teachers participated in short virtual breakout rooms or answered reflection questions.

During the implementation period in November, teachers participated in another one-hour virtual webinar to gain a more in-depth understanding of students' initial placement into the My Math Academy system, develop their skills in making effective use of the Teacher Dashboard, and gain facility in interpreting the Student Stats Dashboard in the Teacher Dashboard. Teachers also gained access to resources outlining how My Math Academy correlates with the Texas Essential Knowledge and Skills (TEKS) standards.

Teachers were asked to encourage each student to use My Math Academy for 45 minutes per week over multiple days (e.g., 15 minutes per day for three days a week). Each student had access to a district-issued iPad that had My Math Academy installed, and students used their individual accounts to log in, either at school or at home.

The kindergarten teachers received the same training in April, and kindergarten students had the same access and usage recommendation as pre-K students.

At the end of the study, teachers were asked to complete a survey and were invited to participate in a one-hour Zoom interview. The survey and interview questions asked teachers to share their experiences with using My Math Academy during the 2020–2021 school year, their observations of student engagement, attitudes, and learning, and their thoughts on the impact of My Math Academy.

Results

Finding 1. Teachers found the data and resources in My Math Academy empowering, enabling them to tailor instruction and gain a deeper understanding of individual students' math progress.

Survey and interview data revealed that in a school year disrupted by the pandemic, teachers found My Math Academy to be a valuable resource that helped them understand what each student was capable of and determine how best to support them individually. The overwhelming majority of 51 teachers surveyed indicated that My Math Academy both complemented and supplemented their instruction (Figure 5).

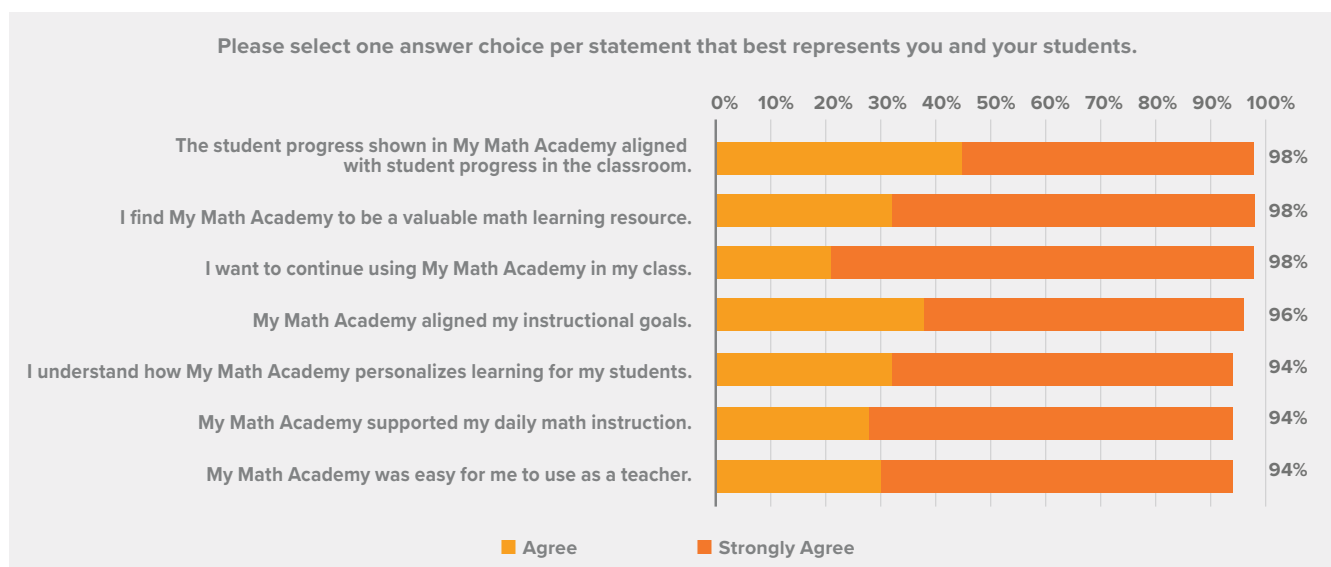


Figure 5. Teacher ratings in response to “Please select one answer choice per statement that best represents you and your students?” on a scale from 0–4 (0 = Strongly agree, 1 = Agree, 2 = Neutral, 3 = Disagree, 4 = Strongly disagree). N = 51

A majority of teachers indicated that the students' progress in My Math Academy aligned with their progress in the classroom. Consistent with findings of prior research, teachers also found that My Math Academy was easy to use, aligned with their instructional goals, and supported their daily math instruction. They further indicated that they understand how My Math Academy personalizes learning for their students and expressed the desire to continue using My Math Academy in their classrooms.

“My Math Academy definitely complemented my instruction very well and helped me see my students' levels in math. It just really provided me with a lot more data and information than I normally would have with a regular math curriculum. This program really does give teachers a whole new view on different lessons and how to implement those lessons. It really did help me a lot, and it's my first year teaching too, so I was in love with this program.”

“The data is so useful. I can level my students right, in tiers. I can see the lessons that they are doing or see what lessons they're struggling [with]. I would write down those lessons and try to get them in interventions, one-on-one practice with them. And I really liked the examples, like ‘oh, use counters to help students . . .’ And it works, so definitely, it did help me differentiate my instruction with my students.”

As suggested in the teacher interviews, the data offered through My Math Academy enabled teachers to identify which individual students needed support on specific skills and what instructional activities would optimally benefit those students. The differentiated instruction provided through My Math Academy built on what students already knew, and the competency they possessed served as the foundation upon which to continue increasing math knowledge, each at their own pace, highlighting the fact that everyone is capable of learning.

Finding 2. Teachers indicated that My Math Academy is a tool that enables them to equitably provide every child with an equal chance of success.

Another common theme from teachers was that My Math Academy was a resource that served every child's learning needs, providing each one an equal chance of experiencing academic success (Figure 6).

"The app was great because it allowed students to move forward at their own level, so my [higher level] students were able to move forward and [it] allowed my slower students to really practice their skills without being rushed to the next skill."

"I have one student who is very verbal and very intelligent. He surprised me because in Pre-K3, he understood what was more than and less than. Usually, at this age, they don't get it, but he got the concept of more and less. . . . And my Spanish kids, it helped them with their English. We are a dual-language campus, and we teach math in English only, so this has helped them a lot. Before, they were confused. . . . You would ask them for a number, but they would give you a letter. But with this, they have learned their numbers in English AND can identify their numbers."

"What I like about My Math Academy is that it builds on their knowledge, and it goes up from what they know as an individual. I liked that it's very individualized. It works for any kid. [As] long as they're playing it on a daily basis, you can see the growth. So, I think it works for everyone."

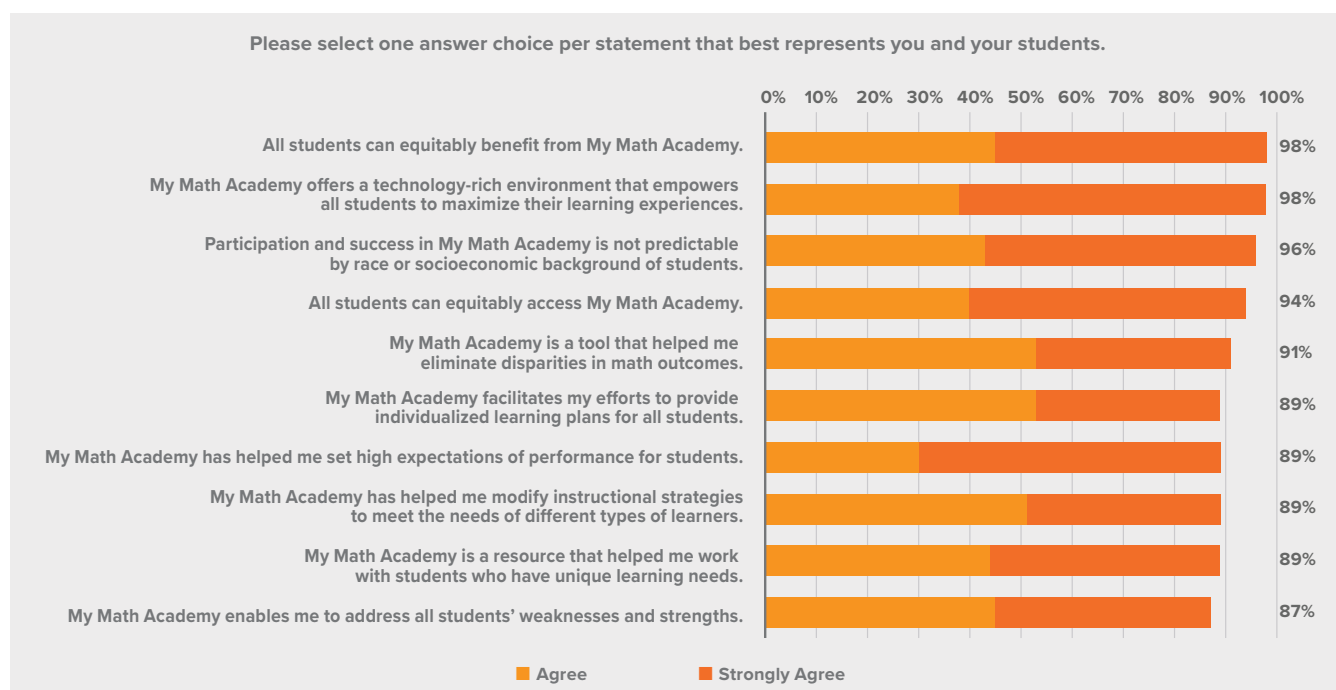


Figure 6. Teacher ratings in response to "Please select one answer choice per statement that best represents you and your students?" on a scale from 0–4 (0 = Strongly agree, 1 = Agree, 2 = Disagree, 4 = Strongly disagree). N = 51

Finding 3. Students who used My Math Academy experienced a two- to threefold increase in their math knowledge.

On average, pre-K students used My Math Academy for 30.09 weeks (SD = 7.18) over the course of the 2020–2021 school year. They spent, on average, 15.18 hours (SD = 11.19) and completed an average of 201.02 Learning Activities (SD = 142.54).

Kindergarten students used My Math Academy for 6.64 weeks (SD = 0.66) from April to June 2021. They spent an average of 6.40 hours (SD = 2.86) and completed an average of 76.15 Learning Activities (SD = 34.31).

By Skills

Pre-K students began the school year with widely varying degrees of prior knowledge, but both Pre-K3 and Pre-K4 students demonstrated substantial increases in their math knowledge over the course of the school year during which they used My Math Academy. Figure 7 shows comparisons of students' prior knowledge (as measured by the in-game pretests) and the knowledge they gained through My Math Academy. When they began using the program, Pre-K3 students demonstrated mastery of 3.86 skills (SD = 7.61), but after using My Math Academy over the school year, their in-game progress indicated their mastery of 15.88 skills on average (SD = 12.86). Similarly, Pre-K4 students started the school year with an average of 10.72 skills (SD = 12.63), and by the end of the school year, they achieved mastery of 32.53 skills on average (SD = 22.11). Thus, skill levels increased by 311% and 203% for Pre-K3 and Pre-K4 students, respectively.

Kindergarten students also demonstrated strong gains despite having had only six to seven weeks of usage. They started in April with an average of 31.78 skills (SD = 15.34, similar to where the Pre-K4 students were in June), and by the end of the school year, they demonstrated mastery of 47.13 skills on average (SD = 18.32), a 48% increase.

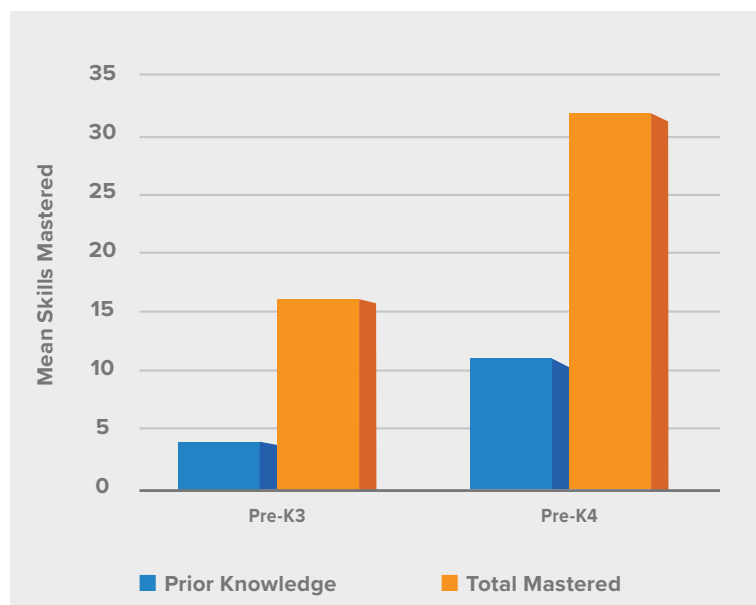


Figure 7. Average number of skills mastered by Pre-K3 and Pre-K4 students as demonstrated by in-game pretest (prior knowledge) and by in-game progress at the end of the school year (total mastered)

By Texas Essential Knowledge and Skills (TEKS) Standards

Because My Math Academy's Learning Objectives can be mapped directly onto the specific skills and concepts required for each TEKS standard, student progress within My Math Academy games can be used to infer their progress on each TEKS standard. Data from My Math Academy suggests that students made significant progress on their grade-level standards as well as on standards beyond their assigned grade levels. Eighteen Pre-K4 students (2%) completed all My Math Academy content and demonstrated mastery on all 2nd grade TEKS for Numbers and Operations, including the benchmark skill of three-digit subtraction with regrouping using the standard algorithm. Another 20 students completed at least 80% of the 2nd grade TEKS.

Additionally, 74% of the Pre-K4 students and 42% percent of the Pre-K3 students completed at least half of the pre-K TEKS, and 53% of the Pre-K4 students and 26% of the Pre-K3 students completed all pre-K TEKS. Figure 8 shows the percentage of students in Pre-K3 and Pre-K4 who completed at least 50% of the pre-K TEKS, 100% of the pre-K TEKS, and at least one higher grade-level TEKS. This places an average Pre-K3 student at the beginning of kindergarten level on number sense and operations, and an average Pre-K4 student at the middle of kindergarten level. At the end of the school year, the Pre-K4 students were at a level slightly higher than the kindergarten students, suggesting that the Pre-K4 students were advancing nearly a year beyond typical kindergarten students in the district.

"When they start off in pre-K, we don't know what they can and cannot do, and we are so set in our own ways in teaching, like, this is what they need to know. Yet with your program, we could see seven students who excelled higher than we could ever have imagined. And we would not have known without this program."

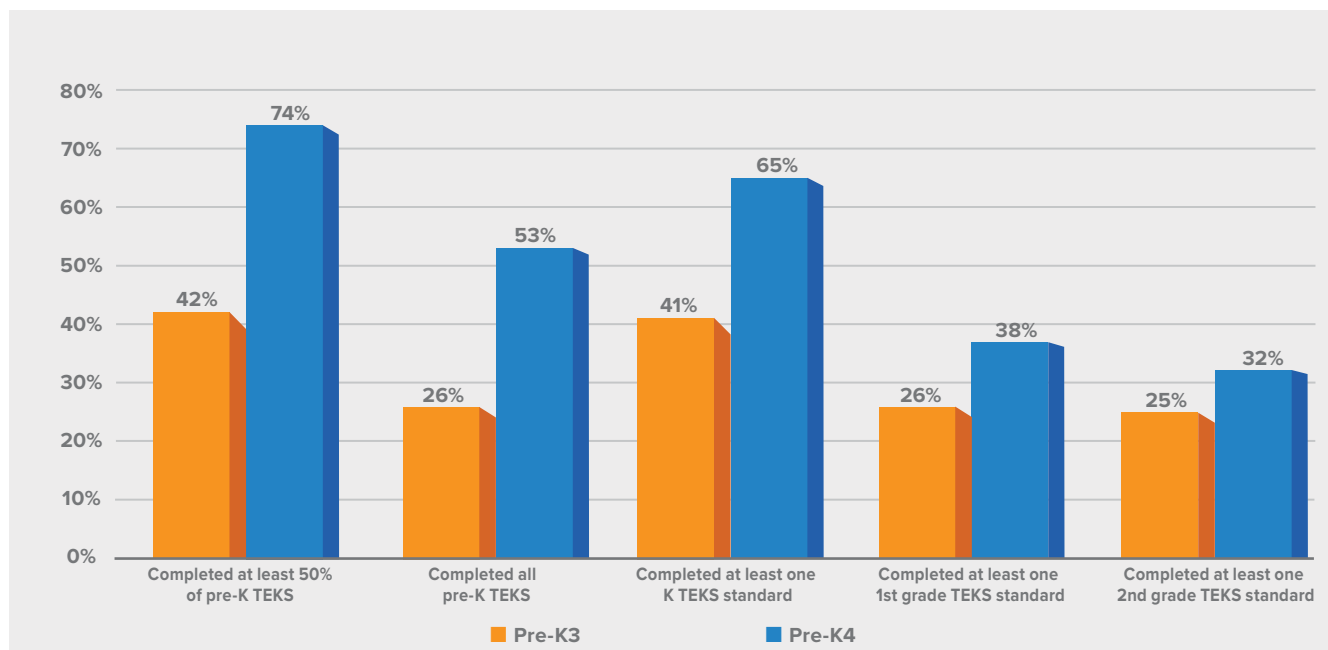


Figure 8. Percentage of students in Pre-K4 and Pre-K3 who completed grade level and beyond TEKS

Teacher Reports

Data collected through teacher surveys (n = 51) and interviews (n = 9) confirmed the learning gains shown through students' in-game progress. More than 90% of teachers reported that My Math Academy had a “positive” or “very positive” impact on students' math learning gains (Figure 9). These results corroborate those of earlier randomized-controlled trials of My Math Academy, which consistently demonstrated that the program was effective in helping children accelerate their math learning.

Teachers also reported that their students learned a great deal from My Math Academy, with some pre-K students experiencing accelerated learning and completing 2nd-grade-level mathematics content. They also described how My Math Academy helped them close the gaps exacerbated by the COVID-19 pandemic.

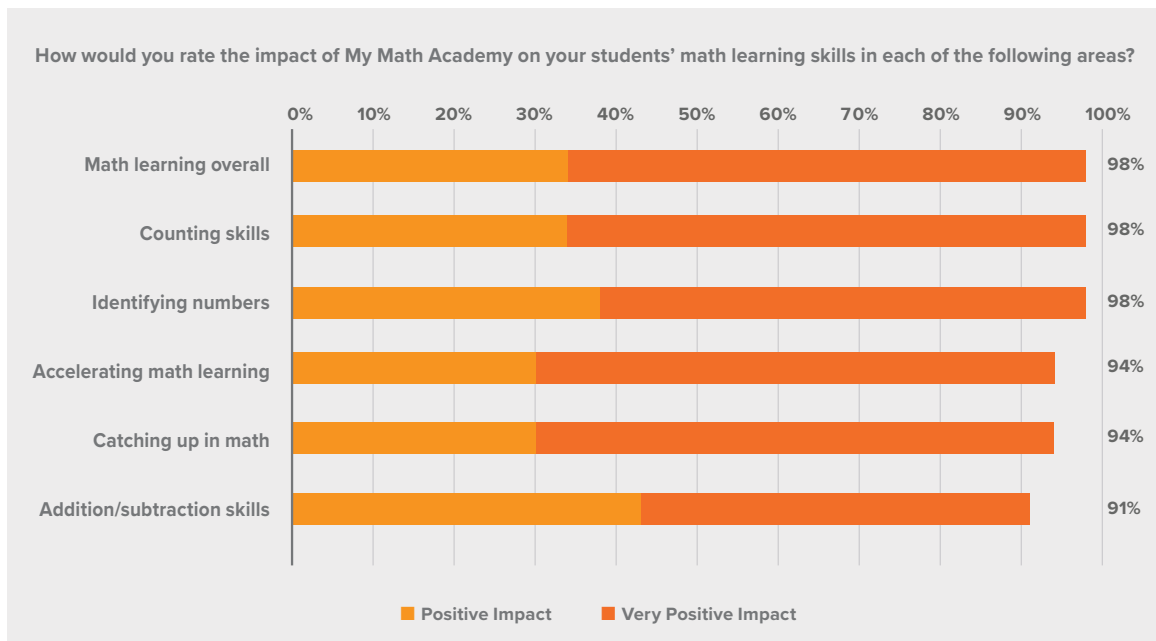


Figure 9. Teacher ratings in response to “How would you rate the impact of My Math Academy on your students' math learning skills in each of the following areas?” on a scale from 0–4 (0 = Very negative impact, 1 = Negative impact, 2 = No impact, 3 = Positive impact, 4 = Very positive impact). N = 51

“They developed a strong passion for math and it’s so wonderful that they were given an opportunity to start in prekindergarten. Some of my students passed the levels all the way to 2nd grade and are wanting to keep learning! My students’ overall math learning increased drastically, and I can’t wait to see what My Math Academy has to offer them in the future!”

Finding 4. Teachers reported that My Math Academy had a significant positive impact on students' interest, enjoyment, and confidence in learning math.

Nearly all teachers reported that My Math Academy had a “positive” or “very positive” impact on students' attitudes and behaviors that facilitate students' participation and enhance their chances of academic success.²² Ninety-eight percent of teachers reported that My Math Academy increased students' interest, enjoyment, and self-confidence in

²² DiPerna, J. C., & Elliott, S. N. (2002). Promoting academic enablers to improve student achievement: An introduction to the mini-series. *School Psychology Review*, 31(3), 293–297.

learning math. Ninety-six percent also indicated that My Math Academy improved students' engagement in learning math, as well as their focus and attention during math lessons (Figure 10). These results suggest that My Math Academy also supports educators who seek to implement curriculum that promotes the well-being of children and creates learning environments that foster positive attitudes toward learning.

Additionally, a majority of teachers confirmed that My Math Academy provided a rich learning environment with lovable characters. They also indicated that the program situates math learning games with relatable scenarios, which likely helped children remain engaged while using My Math Academy (Figure 11).

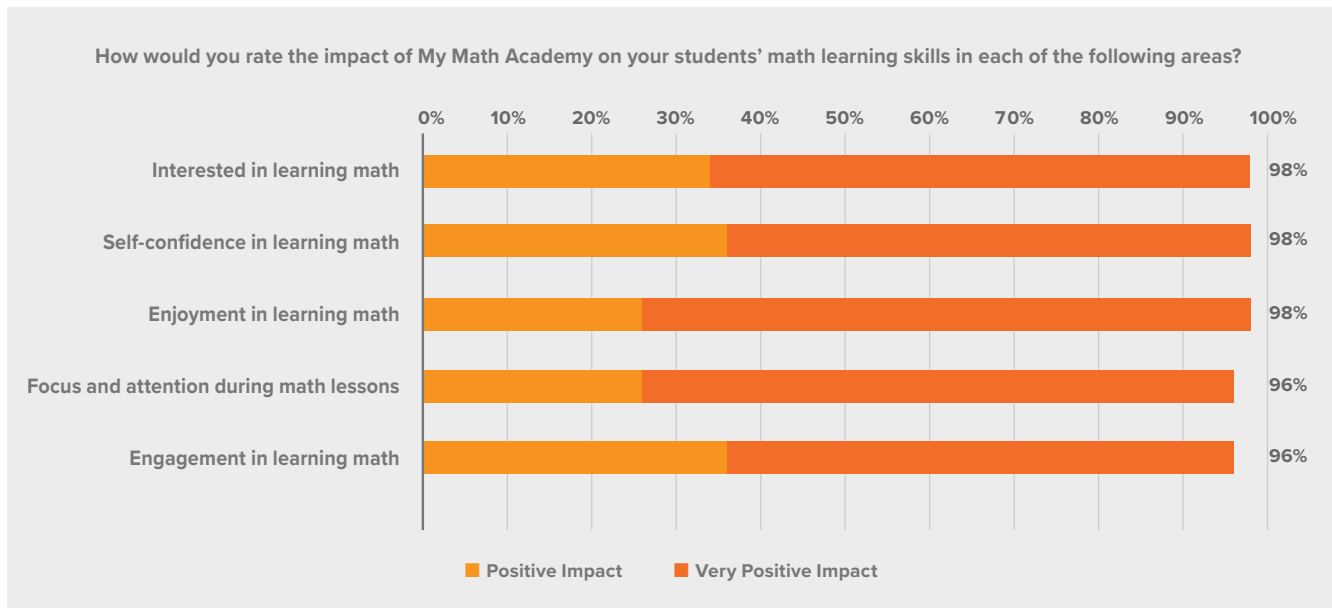


Figure 10. Teacher ratings are in response to “How would you rate the impact of My Math Academy on your students’ math learning skills in each of the following areas?” on a scale from 0–4 (0 = Very negative impact, 1 = Negative impact, 2 = No impact, 3 = Positive impact, 4 = Very positive impact). N = 51

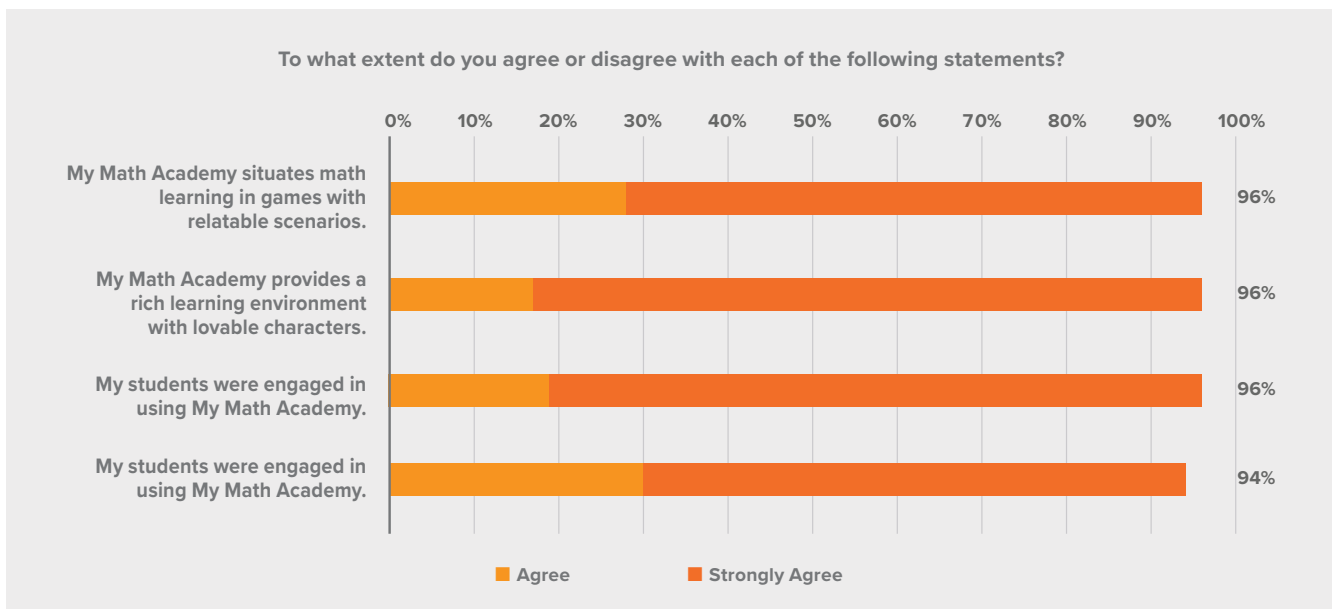


Figure 11. Teacher ratings in response to “To what extent do you agree or disagree with each of the following statements?” on a scale from 0–4 (0 = Strongly agree, 1 = Agree, 2 = Neutral, 3 = Disagree, 4 = Strongly disagree). N = 51

When asked to compare My Math Academy to other math educational technology, an overwhelming majority of teachers reported that their students learned more when using My Math Academy. Teachers also found that their students were more engaged, more motivated, and more confident in learning math with My Math Academy than with any other math educational technology product (Figure 12). A majority of teachers also reported that My Math Academy promoted persistence in learning math, fostered students' growth mindset, helped students develop a positive view of themselves as learners, and provided students with agency over their own learning (Figure 13).

"The students were eager to do My Math Academy in comparison to other math apps/websites."

"My Math Academy got some of my reluctant math learners to be excited about practicing math."

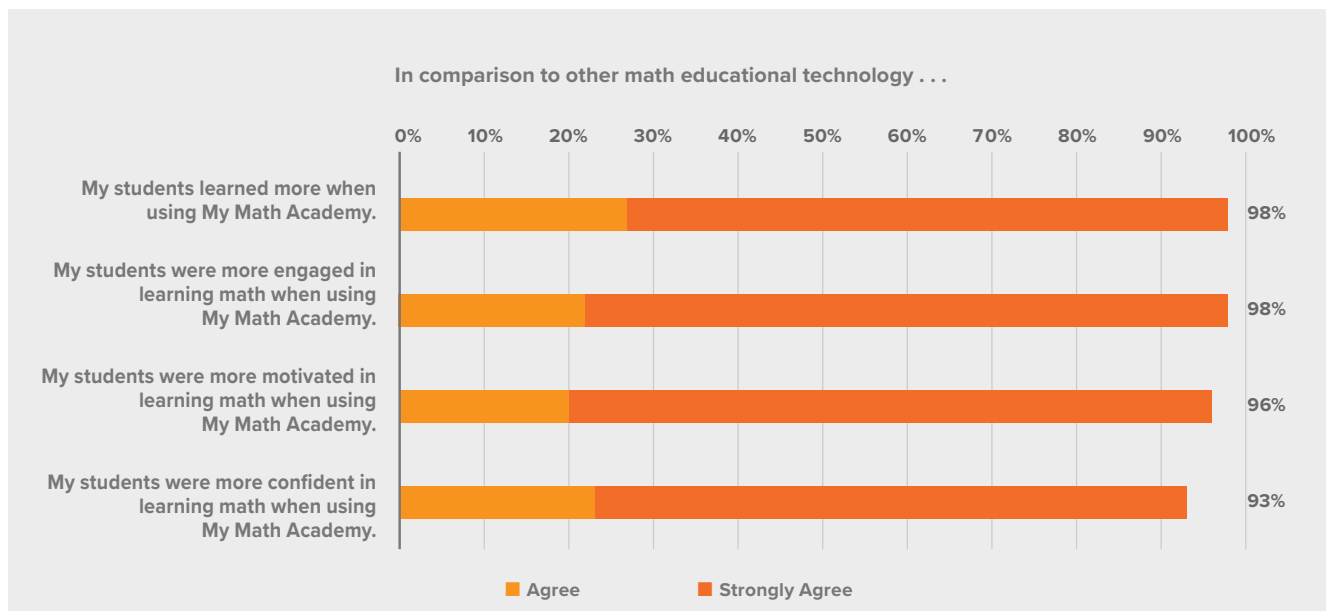


Figure 12. Teacher ratings in response to "In comparison to other math educational technology . . . to what extent do you agree or disagree with each of the following statements?" on a scale from 0–4 (0 = Strongly agree, 1 = Agree, 2 = Neutral, 3 = Disagree, 4 = Strongly disagree). N = 51

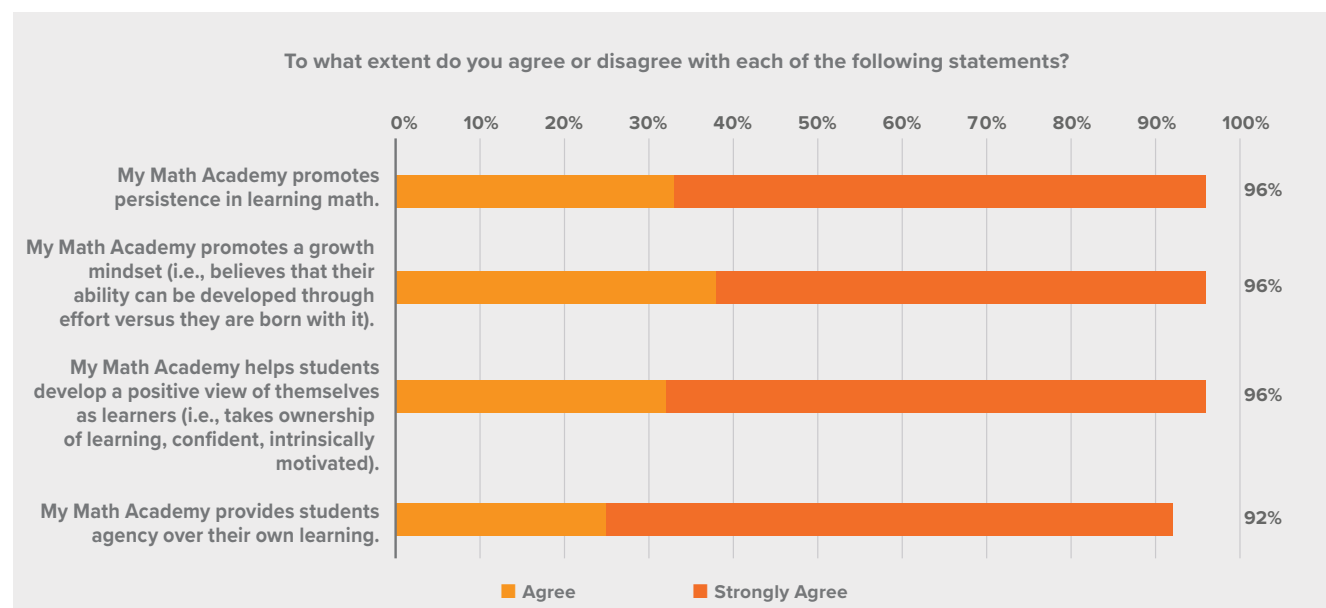


Figure 13. Teacher ratings in response to "To what extent do you agree or disagree with each of the following statements?" on a scale from 0–4 (0 = Strongly agree, 1 = Agree, 2 = Neutral, 3 = Disagree, 4 = Strongly disagree). N = 51

Conclusion

This study provides rich contextual information on how teachers in one school district in Texas helped their young students (three- and four-year-olds) experience success in learning math in a school year disrupted by the COVID-19 pandemic. By the end of the school year, pre-K students had doubled or tripled their math knowledge. A substantial proportion of students demonstrated knowledge of not only grade-level standards but also those beyond their grade level. Furthermore, this research corroborates other studies of My Math Academy that have demonstrated the program's impact on students' interest, enjoyment, and confidence in learning math.^{14,15} The evidence surrounding My Math Academy has also been reviewed by a third-party educational research company, LearnPlatform, as meeting ESSA Level I standards for "Strong Evidence."

This study further adds to the existing body of knowledge with preliminary evidence of the utility of the student progress monitoring tools and instructional resources offered through the Teacher Dashboard. The data offered to teachers equipped them with deeper insights about what their students know and empowered them to deliver more individualized instruction, building on the personalized learning that students experienced through My Math Academy's games. My Math Academy's Personalized Mastery Learning Ecosystem makes it possible for educators to provide each student an equal opportunity to succeed in early math and beyond.

About Age of Learning School Solutions

At Age of Learning School Solutions, we aim to reimagine education, joining educators to deliver equitable solutions that accelerate learning for all students. Our student-first, standards-aligned digital education programs are proven to support students in achieving mastery and collectively accelerate learning gains. By providing personalized, easy-to-implement solutions, we support educators in delivering targeted instruction to address individual student needs, giving each child an engaging, customized path to learning success.

Recently launched after six years of research and development, My Math Academy is an effective and engaging game-based program that provides students with personalized math learning, helping them build essential skills and develop confidence as learners. Our portfolio of student-first, standards-aligned educational programs for schools also includes My Reading Academy.

For more information on Age of Learning School Solutions, visit www.AgeofLearning.com/schools